UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,625	08/20/2003	Christopher A. Poirier	200208727-1	7519

22879   7590   05/18/2007

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER
WHITMORE, STACY

ART UNIT	PAPER NUMBER
2825	

MAIL DATE	DELIVERY MODE
05/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/644,625
Filing Date: August 20, 2003
Appellant(s): POIRIER ET AL.

MAILED

..AÍ 1 8 2007

GROUP 2800

Michael A. Papalas
<u>For Appellant</u>

EXAMINER'S ANSWER

This is in response to the appeal brief filed February 14, 2007 appealing from the Office

action mailed October 17, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,694,492	SHAKKARWAR	2-2004
US 2003/0225999	ROGENMOSER	12-2003

KR 9405466   KIM   6-1994

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

FINAL ACTION

1.   Claims 1-3, 8-13, 16-21, and 24-27 rejected under 35 U.S.C. 102(e) as being anticipated by Shakkarwar (US Patent 6,694,492).

2.   As for claims 1-3, 8-13, 16-21, and 24-27, Shakkarwar discloses the invention as claimed, including the system/ means for, method, and computer program product, having an IC on a VLSI die, and embedded micro-controller on the die adapted to monitor and control the VLSI environment to optimize the IC operation, and further monitors one or more of temperatures at one or more locations, power supplied to the IC, the IC power supply, clock frequency, power supply voltage, power supply current to the IC, fuse for providing hardware selection of parameters that are monitored, firmware, controlling the environment to optimize an IC operating power level/frequency to approach a design limit, reducing power supply voltage/clock frequency in response to over temperature [fig. 1, elements 130, 107, 137, 149, 139, 103; col. 3, lines 16-19, 34-36, 44-47; col. 4, lines 4-13, 20-54; col. 6, lines 34-62; col. 9, lines 26-29, 44-52; col. 10, lines 1-3, 22-29, and 59-62].

3.   Claims 4, 14, 22, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shakkarwar (US Patent 6,694,492) in view of Rogenmoser (US Patent Application Publication 2003/0225999).

As for claims 4, 14, 22, and 28, Shakkarwar discloses the invention substantially as claimed, including the including the system/ means for, method, and computer program

product, having an IC on a VLSI die, and embedded micro-controller on the die adapted to monitor and control the VLSI environment as cited above in the rejection of claim 1. Shakkarwar further discloses temperature sensor for the purpose of reducing operating frequency as cited in the rejection of claim 1.

Shakkarwar does not specifically disclose the IC having two or more processor cores each with an integer and floating point unit and temperature sensors at each of the units or transferring a processing workload from one unit to another.

Rogenmoser discloses an having two or more processor cores each with an integer and floating point unit as well as reducing the operating frequency and transferring a processing workload from one unit to another [fig. 4, paragraphs 0057, 0064-0067; paragraphs 0045, 0048, 0049-0052].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Shakkarwar and Rogenmoser because applying Shakkarwar's monitoring of temperature at each of the units for over temperature and transferring a processing workload from one unit to another would maintain a processor such as Rogenmoser's to within design limits for overheating which would meet restrictions for export [see Rogenmoser, paragraph 0064].

4.   Claims 5, 15, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shakkarwar (US Patent 6,694,492) in view of Kim, K. (Korean Patent Publication 9405466 B1).

5.   As for claims 5, 15, and 23, Shakkarwar discloses the invention substantially as claimed, including the including the system/ means for, method, and computer program product, having an IC on a VLSI die, and embedded micro-controller on the die adapted to monitor and control the VLSI environment as cited above in the rejection of claim 1.

Shakkarwar further discloses monitoring and controlling current to the IC as cited above in the rejection of claim 1.

Shakkarwar does not specifically disclose ammeters comprising VCOs.

Kim discloses ammeters comprising VCOs

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Shakkarwar and Kim because monitoring current levels with ammeters and VCOs would provide Shakkarwar's system with a way of determining current by utilizing voltage and resistance for calculation which would further aid Shakkarwar's system to determine over-temperature due to current levels.

(10) Response to Argument

Argument A1 (claims 1, 8, 16, and 24) (page 7)

Appellant argues in substance Shakkarwar does not disclose said embedded micro-controller monitors temperatures at a plurality of locations; monitoring a plurality of areas; Shakkarwar's disclosure of a single sensor does not disclose monitoring temperatures at a plurality of locations; Shakkarwar does not disclose thermal parameters are measured at more than one location.

As to argument A1, examiner respectfully disagrees for the following reasons:

Shakkarwar discloses said embedded micro-controller monitors temperatures at a plurality of locations [fig. 1, elements 130, 107, and 148; col. 4, lines 16-54; col. 6, lines 39-62; Shakkarwar discloses that the internal controller (embedded micro-controller is incorporated within the CPU of figure 1, that includes multiple sub-

components, can use various inputs, such as test vectors to stimulate to CPU's

functions or sub-components operation under various conditions in which the thermal

sensor 130 monitors and assesses the response of functions or sub-components.

These assessments and responses are sent to the internal controller 130 in order to

make adjustments in operating conditions such as operational voltage and/or operation

rate of the IC]; monitoring a plurality of areas [fig. 1, elements 130, 107, and 148; col. 4,

lines 16-54; col. 6, lines 39-62; Shakkarwar discloses that the internal controller

(embedded micro-controller is incorporated within the CPU of figure 1, that includes

multiple sub-components, can use various inputs, such as test vectors to stimulate to

CPU's functions or sub-components operation under various conditions in which the

thermal sensor 130 monitors and assesses the response of functions or sub-

components. These assessments and responses are sent to the internal controller 130

in order to make adjustments in operating conditions such as operational voltage and/or

operation rate of the IC];

In response to the argument that Shakkarwar's disclosure of a single sensor

does not disclose monitoring temperatures at a plurality of locations, examiner first

contends that this argument is irrelevant since appellant's argument is directed to non-

claimed subject matter. Second, Shakkarwar's disclosure of a single sensor does

disclose monitoring temperatures at a plurality of locations [fig. 1, elements 130, 107,

and 148; col. 4, lines 16-54; col. 6, lines 39-62; Shakkarwar discloses that the internal

controller (embedded micro-controller is incorporated within the CPU of figure 1, that

includes multiple sub-components, can use various inputs, such as test vectors to

stimulate to CPU's functions or sub-components operation under various conditions in which the thermal sensor 130 monitors and assesses the response of functions or sub-components];

In response to the argument that Shakkarwar does not disclose thermal parameters are measured at more than one location, examiner first contends that this argument is irrelevant since appellant's argument is directed to non-claimed subject matter. Second, Shakkarwar does disclose thermal parameters are measured at more than one location [fig. 1, elements 130, 107, and 148; col. 4, lines 16-54; col. 6, lines 39-62; Shakkarwar discloses that the internal controller (embedded micro-controller is incorporated within the CPU of figure 1, that includes multiple sub-components, can use various inputs, such as test vectors to stimulate to CPU's functions or sub-components operation under various conditions in which the thermal sensor 130 monitors and assesses the response of functions or sub-components. These assessments and responses are sent to the internal controller 130 in order to make adjustments in operating conditions such as operational voltage and/or operation rate of the IC]; monitoring a plurality of areas [fig. 1, elements 130, 107, and 148; col. 4, lines 16-54; col. 6, lines 39-62; Shakkarwar discloses that the internal controller (embedded micro-controller is incorporated within the CPU of figure 1, that includes multiple sub-components, can use various inputs, such as test vectors to stimulate to CPU's functions or sub-components operation under various conditions in which the thermal sensor 130 monitors and assesses the response of functions or sub-components].

Argument A2a (claim 6) (page 8)

Appellant argues in substance Shakkarwar does not disclose, and there is no

rejection of record that fuses that provide hardware selection of VLSI integrated circuit

environment parameters that are monitored by the embedded micro-controller.

Examiner respectfully disagrees for the following reasons:

First, the final rejection of record, dated October 17, 2006 sets forth the rejection

of the argued and claimed subject matter of claim 6 in paragraph 2 of the office action.

Specifically in the rejection, examiner included the claimed subject matter "fuse for

providing hardware selection of parameters that are monitored", although not typed

exactly as applicant claimed, does include the subject matter of claim 6 in the rejection.

Second, Shakkarwar does disclose that fuses that provide hardware selection of

VLSI integrated circuit environment parameters that are monitored by the embedded

micro-controller [col. 3, lines 34-50, where fuses are used to provide a hardware

selection of VLSI environment parameters (clock rate and voltage are viewed to be

VLSI environment parameters) which are then set in the clock and voltage register. In

col. 4, lines 4-51, Shakkarwar shows that these parameters are monitored by the

embedded micro-controller 130].

Argument A2b (claim 7) (page 8)

Appellant argues in substance that Shakkarwar does not disclose, and there is

no rejection of record that Shakkarwar discloses updateable or replaceable firmware,

said firmware comprising algorithms for determining how to respond to temperature, power, voltage, or clock parameters.

Examiner respectfully disagrees for the following reasons:

First, the final rejection of record, dated October 17, 2006, sets forth the rejection of the claimed subject matter that Shakkarwar discloses updateable or replaceable firmware, said firmware comprising algorithms for determining how to respond to temperature, power, voltage, or clock parameters in paragraph 2 of the office action. Specifically, the rejection includes col. 6, lines 40-62, wherein the internal controller 130 is programmable (it is viewed to be firmware because it is hardware that includes software that is updateable or replaceable by programming). The algorithm would be the program used for the monitoring and adjusting of the operational states of the CPU].

Second, Shakkarwar discloses updateable or replaceable firmware, said firmware comprising algorithms for determining how to respond to temperature, power, voltage, or clock parameters [fig. 1, element 130; col. 4, lines 4-51; and col. 6, lines 40-62; Specifically, col. 6, lines 40-62, wherein the internal controller 130 is programmable (it is viewed to be firmware because it is hardware that includes software that is updateable or replaceable by programming). The algorithm would be the program used for the monitoring and adjusting of the operational states of the CPU].

Argument A2c (claims 20-21) (page 9)

Appellant argues in substance that examiner does not specifically point out where, in Shakkarwar, every limitation of claim 20 is satisfied; and that Shakkarwar does not disclose monitoring a temperature in a core of the processor.

Examiner respectfully disagrees with appellant for the following reasons:

The final rejection of record, dated October 17, 2006, sets forth the rejection of the claimed subject matter pf claim 20, specifically at paragraph 2. The rejection includes col. 4, lines 4-51, and col. 6, lines 40-62, and figure 1, at least element 130. Shakkarwar's system involves code (by programming the internal controller, by using test vectors, and input from the thermal sensor for monitoring, assessing, and adjusting the operational states of the functions and sub-components of the CPU element 102 of Fig. 1. The functions and sub-components include the core of the processor element 106, of fig. 1).

Argument A2d (claims 29-32) (pages 9-10)

Appellant argues in substance Shakkarwar does not disclose said embedded micro-controller is further adapted to detect a difference in temperatures between said plurality of locations on the IC and redistribute workload in response to said temperature difference; thermal parameters are measured at more than one location; and operating voltage or frequency is changed in response to temperature differences.

As to argument A2d, examiner agrees with appellant in that Shakkarwar does not disclose said embedded micro-controller is further adapted to detect a difference in temperatures between said plurality of locations on the IC and redistribute workload in

response to said temperature difference. Therefore, the rejection of record is withdrawn for claims 29-32.

Further the remaining arguments of thermal parameters are measured at more than one location; and operating voltage or frequency is changed in response to temperature differences are moot since the rejection of record is withdrawn, and also because the arguments are directed to non-claimed subject matter with respect to claims 29-32.

Argument B1 (claim 4) (pages 10-11)

Appellant argues in substance that Shakkarwar does not disclose temperature sensors at each of the integer and floating point units.

As to argument B1, examiner agrees with appellant, and the rejection of record is hereby withdrawn.

Argument B2 (claims 14 and 28) (pages 11-12)

Appellant argues in substance that Shakkarwar does not disclose the IC having two or more processor cores each with integer and floating point units and temperature sensors at each of the units.

As to argument B2, examiner agrees with appellant, and the rejection of record is hereby withdrawn.

Argument B3 (claim 22) (pages 12-13)

Appellant argues in substance that Shakkarwar and Rogenmoser do not disclose the processor has a first core and a second core; monitoring a temperature in a first core of the processor; Shakkarwar and Rogenmoser do not disclose all the limitations of claim 22.

As to argument B3, examiner agrees that the combination of Shakkarwar and Rogenmoser do not disclose all the limitations of claim 22, specifically that Shakkarwar and Rogenmoser do not disclose code for transferring a processing workload from the first core to the second core of the processor in response to the temperature of said first core. The rejection of record is hereby withdrawn. Further the remaining arguments of section B3 are rendered moot since the rejection of the claim is withdrawn.

Argument C (claims 5, 15, and 23) (page 13)

Appellant argues in substance that the combination of Shakkarwar and Kim would not result in the claimed subject matter of claims 5, 15, and 23, either at least by motivation to combine the references; and that Shakkarwar fails to disclose said embedded micro-controller monitors temperatures at a plurality of locations in the integrated circuit.

As to argument C, appellant's argument that the combination of Shakkarwar and Kim does not lead to the claimed subject matter specifically, that the combination of Shakkarwar and Kim would not lead to claimed subject matter of the ammeters comprising voltage controlled oscillators being embedded on the VLSI integrated circuit die is found persuasive, and therefore, the rejection of record is hereby withdrawn.

The remaining arguments with respect to claims 5, 15, and 23 are rendered moot, since the rejection of record is withdrawn.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.
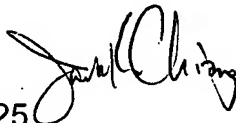
Respectfully submitted,

Stacy Whitmore

Primary Examiner, Art Unit 2825

Conferees:

Jack Chiang, SPE Art Unit 2825

David Blum, Appeal Conference Specialist